

## ABSTRACT

This short article is aimed at promoting professional chemists to discuss their interest in their subject, chemistry, in the hope that they will share that interest with others and encourage young people into studying chemistry. The article tells four stories, three of which show positive role models for encouraging an interest in chemistry and one of which is less positive.

## Chemical controversies: can and should we do more to interest students in chemistry?

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This topic is endlessly debated. Perhaps others may sometimes feel, like me, that chemistry has given them a high degree of satisfaction as a subject both in intellectual and in career terms. On those occasions, one feels that the very least that one can do in return is to try to interest young people in chemistry to ensure its future.

Then there are the other days, when one sees the crass and stupid decisions of the bureaucrats in cutting university research in chemistry, in throwing good chemistry teachers and lecturers out of jobs, in charging chemistry students higher HECS than Arts students and in failing to make an even half good career path for young researchers! They do all those things in the name of the market!

'B---- it!' one might say! Why encourage anyone into any of the sciences? Let the laws of supply and demand take effect. If they don't reward scientists properly- then let them do without the future benefits of science. Let economic rationalism be a two-way street! These are tempting lines of thought, but they lead nowhere.

Let us assume that we reject the above scenario and instead reflect on what persuaded each of us into studying chemistry - particularly where it might lead us into some positive actions. There are positive role models from brilliant lecturers:

Students fell in love with chemistry because of his lectures; the lectures were clear, understandable and fun! He was demanding but his enthusiasm was contagious. Everything I do right, I learned from watching him. Positive role models are essential. Enthusiasm is seductive. (Duffy, 1997)

For others the role model may be on film or TV. Worley (1989) said that Sir Lawrence Bragg's "children's lecture" at the Royal Institution excited his interest in science.

Worley also mentions the predictive power of the periodic table, the writing of Isaac Asimov as a science populariser rather than an author of science fiction, and the beautiful blue colour of copper (II) sulphate solution. The Chemistry Nobel prize winner, Dorothy Crowfoot Hodgkin, was fascinated by crystals at the age of ten, captivated by the elegance and beauty of their geometric shapes (Hunter, 1993). She reminisces that:

I was present for the beginning of Chemistry, growing crystals - copper sulphate and alum and was immediately captured. (Hodgkin, 1988)

Her interest in chemistry had been initially aroused through a family friend (Uncle Joseph), who was the Government Chemist in Sudan and he had given her a chemistry set. Her interest in crystals was intensified some

years later when her mother gave her the book (Anon 1991) by William Bragg entitled *On the nature of things*, which gave her an insight into the causes of crystal structure. Crystal structure was to be her life's work.

And F. J. Moorhouse remembers the following:

Teacher: "Now, boys. we are about to demonstrate an exothermic reaction." (Writes on blackboard.)

Boys: "Yes. sir."

Teacher "We take a piece of calcium hydroxide in a pair of tongs and hold it over a bunsen burner until it glows. We then leave it to cool." (Boys do as they're told, then scribble notes while the substance cools.)

Teacher: "We now have calcium oxide. Put a largish piece in the palm of your hand and allow water to drip from the tap on to it" (Boys do so.)

Teacher: "This is called ... "

Boys: "Aaaaagh!"

Teacher: " ... an exothermic reaction. If any of you had kept the piece of material in your hands, you would have seen the reconstituted calcium hydroxide." (Feedback 1995)

The resulting blister lasted several days. Moorhouse says, leaving the boys with an indelible memory of what an exothermic reaction was.

The four stories above are very different with the first three giving a positive image of chemistry and the last one a negative image of chemistry. (However, one wonders if all students were turned off chemistry by this). The sources for the stories too are deliberately of different types to indicate the varying ways in which information can be obtained.

I continue with research to find out what evidence there is for believing that chemistry teachers, parents, friends and relations can influence students into science as a career by providing a variety of experiences, that at least make them aware of chemistry/ science. Over a period of 6 years I provided students at Northern Territory University with a questionnaire (Palmer, 1995) to find out about their memories of science and/or chemistry. Very little was remembered of chemistry and not a lot from the whole of science. Quite a few comments were negative. A typical comment was "Physics and chemistry were just a touch boring for me ... " However generally students were better at remembering out of class (rather than in-class) events of a wide variety of types. Thus things teachers do to interest students are remembered by some few children, but there is no way of knowing who will be influenced by what. The best advice one can give to interest students in chemistry (if we can agree on that aim) is to provide a wide variety of activities. Some children will respond.

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